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A security closure

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Abstract

A security closure comprising a frame which defines the perimeter of the closure where the frame is adapted to be mounted across an opening, a perforate sheet element supported by said frame to close the space defined by the frame, said perforate sheet element being formed of a non-expanded sheet material having a plurality of closely spaced apertures punched therein which are dimensioned to prevent insect access through the apertures.



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COMPLETE SPECIFICATION

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Invention Title: A Security Closure

The following statement is a full description of this invention, including the best method of performing it known to me:-

"A Security Closure"

Background

This invention relates to security screens which may be applied over windows and/or doorways for the purposes of enabling ventilation through the window or door when
5 open but to prevent the access of insects past the screen. In addition the closure needs to be resistant to destructive forces to prevent unauthorised access past the screen.

Disclosure of the Invention

Accordingly the invention resides in a security closure comprising a frame which
10 defines the perimeter of the closure where the frame is adapted to be mounted across an opening, a metallic perforate sheet element supported by said frame to close the space defined by the frame, said perforate sheet element being formed of a non-expanded stainless steel sheet having a thickness sufficient to withstand penetration as a result of impact by blunt objects and having a plurality
15 of closely spaced apertures punched therein which are dimensioned to prevent insect access through the apertures and wherein the spacing of the apertures provides a substantially unrestricted view through the sheet element.

According to a preferred feature wherein the side edges of the sheet element which are supported by the sides of the frame are formed with a lip, the frame formed with
20 a recess having an opening directed inwardly with respect to the closure, the side edges of the sheet element being received within the recess such that the lip is located within the recess, an elongate locking member received and fixed in the recess outward of the lip.

According to one particular embodiment the engagement of the locking member in
25 the recess is, at least in part, frictional.

According to another particular embodiment the engagement of the locking member to the one side at least in part comprises the interengagement of complementary formations provided on opposed faces of the locking member and the recess.



According to a preferred feature of the embodiment the complementary formations comprise serrated-like formations.

According to another preferred feature of the invention the engagement of the locking member in the recess is at least in part effected by fixing elements between
5 the locking member and the frame. According to one embodiment the fixing elements comprise rivets.

According to a preferred feature of the invention the sheet element is powder coated.

According to a preferred feature of the invention, the locking member substantially
10 fills the space in the recess between the lip and the opening.

According to a further preferred feature of the invention the locking member is formed of increasing thickness to be wedgingly engaged between the recess and the sheet element.

According to a preferred feature of the invention the apertures have a diameter of
15 between 1.6 mm to 3.6 mm. According to a preferred feature of the invention the spacing of the apertures center to center is between 2.0 mm and 3.5 mm. According to a preferred feature of the invention the thickness of the stainless steel sheeting is between 0.5 mm and 1.0 mm.

According to a preferred feature of the invention a layer of an electrical insulator is
20 located between abutting surfaces of the sheet element and the locking member. According to one embodiment the electrical insulator comprises a strip formed of a plastics material which is received over the lip and at least the portion of the sheet element closely adjacent the lip which is located within the recess.

According to a preferred feature of the invention each edge of the sheet element is
25 formed with a lip.

According to a preferred feature of the invention the lip at each edge extends for the full length of the respective edge.

The security closure may comprise a closure which is fixed across a window or alternatively may comprise a door which can be selectively moved between an open and closed position across an opening.

The invention will be more fully understood in the light of the following description of
5 several specific embodiment.

Brief Description of the Drawings

The description is made with reference to the accompanying drawings of which:

Figure 1 is a schematic partial sectional elevation of a security closure according to the first embodiment illustrating the mounting of the sheet material to the frame; and

10 Figure 2 is a schematic partial sectional elevation of a security closure according to the second embodiment illustrating the mounting of the sheet material to the frame.

Description of Several Specific Embodiments of the Invention

The first embodiment a shown at Figure 1 is directed to a screen closure which may comprise a screen which is applied across a window or alternatively may comprise a
15 screen door where the closure is required to permit air flow through the window or doorway but to prevent the access of insects through the closure and to prevent unauthorised entry through the accessway.

The screen closure according to the embodiment comprises a frame 11 which defines the perimeter of the closure and which is configured to be received in the
20 window or door frame and is adapted to be fixed thereto in the most appropriate manner. The frame 11 is formed of a metal section formed of aluminium where the section is configured to support the edges of a screen 13 which is formed of perforated stainless steel sheet where the perforations are closely spaced and are dimensioned such as to prevent insect access through the apertures. The apertures
25 are formed by punching. The screen material comprises a non-expanded sheet material. The apertures are dimensioned to prevent the passage of insects such as house flies and mosquitoes through them and are spaced sufficiently closely to

provide a relatively unrestricted view through the screen when observed from a distance. In addition the grade and thickness of the stainless steel sheeting and the spacing of the apertures is such that the sheet is capable of withstanding significant impact forces created by sharp and blunt objects.

- 5 The inner perimeter of the frame 11 is formed with an inwardly directed recess 15 defined between a pair of flanges 17 and 19. The edges of the screen material 13 are each formed with an upstanding lip 21 which is formed by bending the screen material at the edges to form the lip which is substantially perpendicular to the plane of the screen. In mounting the screen to the frame the edge of the screen 13 is received within the recess 15 such that the lip 21 is closely adjacent the base 23 of the recess 15. The screen 13 is retained in position in the recess by means of a elongate locking member 25 which is received between one flange 17 and the opposed face of the screen 13 such that the lip 21 is positioned between locking member 25 and the base 23. The opposed faces of the locking member and the one flange are each formed with a serrated profile where the profiles are complementary and each serration has an inclined face and an upright face and the serrations are arranged on each surface to permit movement of the locking member into the recess but to prevent movement of the locking member from the recess. The locking member 25 is dimensioned such that it will fill the space between the one flange 17 and the screen 13 and as a result clampingly retain the screen 13 against the other flange 19. The inner face of the other flange 19 is also formed with a serrated profile of similar if not identical form to that of the one flange 17. In addition the serrated face of the locking member 25 is inclined with respect to the base of the locking member such that in use the side of the locking member having the lower profile is introduced into the recess first whereby with further introduction of the locking member into the recess the locking member becomes wedgingly engaged.

As a result of the first embodiment, a screen closure is provided which is secure in that the means of retaining the screen securely retains the screen in position in the frame without requiring any fixing or bolting of the screen material to the frame. In addition, the use of perforated non-expanded stainless steel sheet material provides a medium which can be more readily powder coated than screen materials which have been used in the past such as mesh or expanded sheet material. In this

regard the powder coating which is applied to mesh sheet material and expanded sheet material can be the subject of cracking and resultant separation from the sheet material as a result of localised deflection of the sheet material which results in a spoiling of the appearance of the sheet material and can result in corrosion. In
5 addition it has been found that the perforated sheet material can be harder to cut with a knife or similar sharp instrument when compared to some mesh or expanded sheet materials. The perforated sheet material also provides an aesthetically pleasing appearance.

The second embodiment as shown at Figure 2 is of similar form to the first
10 embodiment and as a result the same reference numerals have been used in relation to corresponding elements of the second embodiment. The second embodiment differs from the first embodiment in that it also includes a layer 27 of an electrical insulator which overlies the lip 21 and extends over at least the adjacent portion of each face of the screen 13 which will be received in the recess 15. The
15 layer 27 is formed of a strip formed of a suitable plastics material and is preformed to the configuration of profile of the edge of screen. In assembly of the closure the preformed strip 27 is applied over the edge of the screen and the combination of edge and strip is introduced into the recess at which time the locking member is driven into place.

20 A first example of the second embodiment was constructed to provide a screen door 870mm wide and 2040mm long. The screen was formed of stainless steel sheeting 0.71mm thick of 304 grade and the frame was formed of an aluminium section as shown at Figure 2. The spacing between the apertures in the stainless steel sheet was 3.1 mm and the diameter of the apertures was 2.06 mm. On testing the door in
25 accordance with the requirements of Appendix A of AS/NZS 2803.1:1994, "Method of Test for Resistance to Forced Entry". The door held all required forces and remained a closed deterrent.

A second example of the second embodiment was constructed to provide a screen
30 door 1250mm wide and 2100mm long. The screen was formed of stainless steel sheeting 0.71mm thick of 304 grade and the frame was formed of an aluminium section as shown at Figure 2. The spacing between the apertures in the stainless steel sheet was 3.1 mm and the diameter of the apertures was 2.06 mm. On testing

the door in accordance with the requirements of Appendix B of AS 2803.2:-1995, "Method of Test for Resistance to Forced Entry". The door held all required forces and remained a closed deterrent.

- 5 A third embodiment of the invention is of similar form to the first and second embodiment with the exception that fixing of the locking member to the one flange is supplemented by the use of rivets which are used to fix the one flange to the locking member at spaced intervals along their length.

- 10 According to alternative embodiments of the invention the screen is formed of a stainless steel mesh of a suitable grade to provide apertures small enough to prevent insect access through the screen or an expanded stainless steel sheet material which provide apertures small enough to prevent insect access through the screen.

- 15 Throughout the specification, unless the context requires otherwise, the word "comprise" or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

It should be appreciated that the scope of the present invention need not be limited to the particular scope of the embodiment described above.

Claims

The claims defining the invention are as follows:

- 5 1. A security closure comprising a frame which defines the perimeter of the closure where the frame is adapted to be mounted across an opening, a metallic perforate sheet element supported by said frame to close the space defined by the frame, said perforate sheet element being formed of a non-expanded stainless steel sheet having a thickness sufficient to withstand penetration as a result of impact by blunt objects and having a plurality of closely spaced apertures punched therein which are dimensioned to prevent insect access through the apertures and wherein the spacing of the apertures provides a substantially unrestricted view through the sheet element.
- 10 2. A security closure as claimed at claim 1 wherein the apertures have a diameter of between 1.6 mm to 3.6 mm.
- 15 3. A security closure as claimed claim 1 or 2 wherein the invention the spacing of the apertures center to center is between 2.0 mm and 3.5 mm.
- 20 4. A security closure as claimed claim 1 or 2 or 3 wherein the thickness of the sheet element is between 0.5 mm and 1.0 mm.
- 25 5. A security closure as claimed at any one of claims 1 to 4 wherein the side edges of the sheet element which are supported by the sides of the frame at least are formed with a lip, the frame formed with a recess having an opening directed inwardly with respect to the closure, the edges of the sides of the sheet element having the lip being received within the recess such that the lip is located within the recess, a locking member received and engaged in the recess outward of the lip.
6. A security closure as claimed at claim 5 wherein the engagement of the locking member in the recess at least in part comprises the interengagement of complementary formations provided on opposed faces of the locking member and the recess.



7. A security closure as claimed at claim 6 wherein the complementary formations comprise serrated-like formations.
8. A security closure as claimed at any one of claims 5 to 7 wherein the engagement of the locking member in the recess is effected at least in part by fixing elements between the locking member and the frame.
- 5
9. A security closure as claimed at claim 8 wherein the fixing elements comprise rivets.
10. A security closure as claimed at any one of claims 5 to 9 wherein, the locking member substantially fills the space within the recess between lip and the opening.
- 10
11. A security closure as claimed at any one of claims 5 to 10 wherein a layer of an electrical insulator is located between abutting surfaces of the sheet element and the locking member.
12. A security closure as claimed at claim 11 wherein the electrical insulator comprises a strip formed of a plastics material which is received over the lip and at least the portion of the sheet element closely adjacent the lip which is located within the recess.
- 15
13. A security closure as claimed at any one of the preceding claims wherein sheet element is formed of steel sheet.
14. A security closure as claimed at any one of the preceding claims wherein sheet element is formed of stainless steel sheet.
- 20
15. A security closure as claimed at claim any one of the preceding claims wherein the sheet element is powder coated.
16. A security closure as claimed at any one of claims 5 to 15 wherein each edge of the sheet element is formed with a lip.
- 25

17. A security closure as claimed at any one of claims 5 to 16 wherein the lip at each edge extends for the full length of the respective edge.
18. A security closure as claimed at any one of the preceding claims wherein the security closure comprises a closure which is fixed across a window.
- 5 19. A security closure as claimed at claim 18 wherein the closure can be selectively moved between an open and closed position across the window.
20. A security closure as claimed at any one of claims 1 to 17 wherein the security closure comprises a closure which is fixed across a doorway where the closure can be selectively moved between an open and closed position across the doorway.
- 10 21. A security closure substantially as herein described.

Dated this Thirteenth day of November 2001

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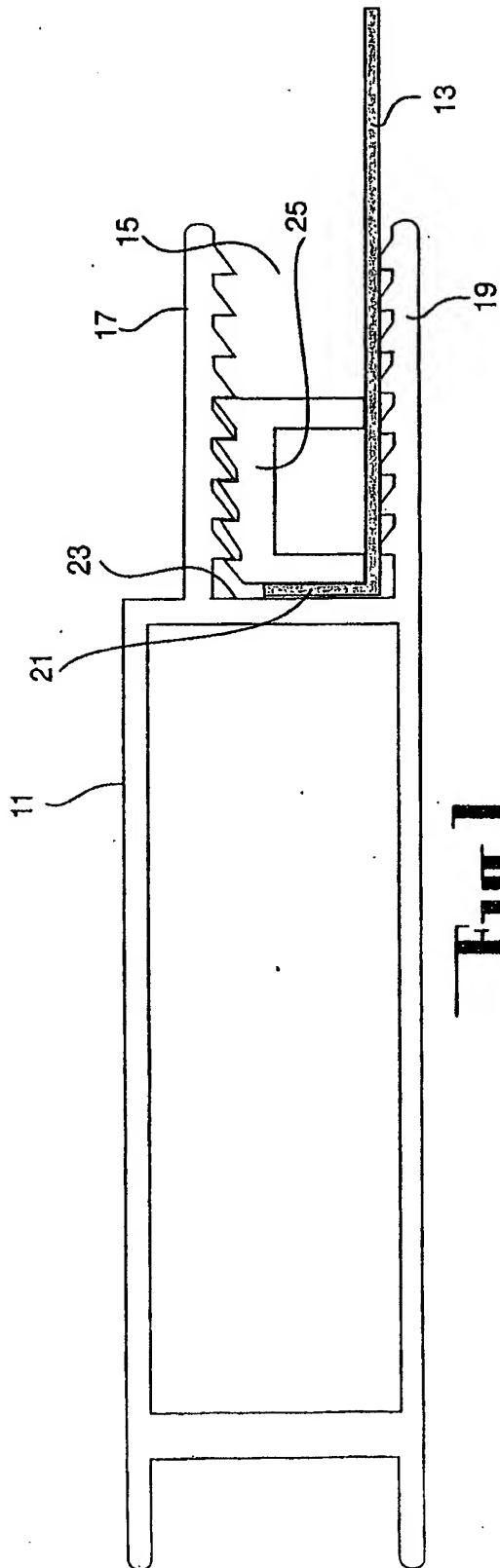


Fig. 1

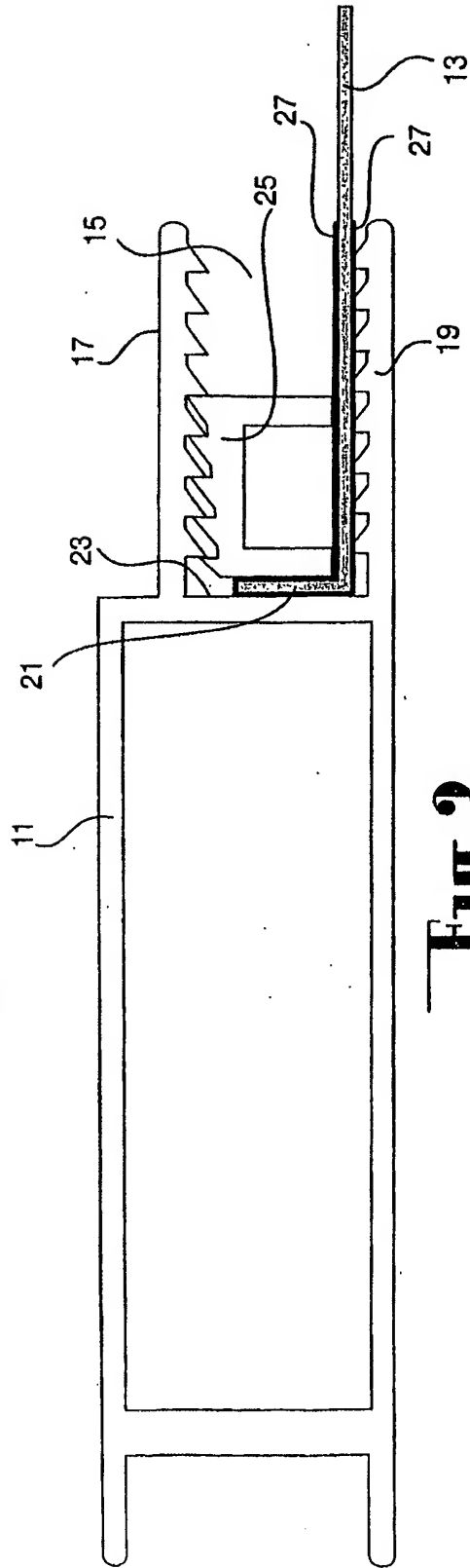


Fig. 2